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# ***An Overview of the Joint Munitions Planning System***

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23 July 2005

Presented to:

73<sup>rd</sup> MORSS

USA Military Academy

West Point, NY

***Argonne National Laboratory***



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# ***Briefing Outline***

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- Overview of the Joint Munitions Planning System
  - Development History and High Level Overview
  - Operating Environment
  - Key Features
- Examples of JMPS-Developed Sourcing Solutions
- Summary



# ***JMPS Development History and High Level Overview***

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- Sponsored by US Army Field Support Command
- Developed by Argonne National Laboratory
- Began in FY 1999 with Delivery and Transitioning Scheduled for FY 2005.
- Intended as a Replacement for the Fortran-Based Ammunition Distribution System (ADS)



# ***JMPS Development History and High Level Overview (Cont.)***

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- JMPS was Developed to Support Sourcing and Movement Solutions from CONUS and OCONUS to Generate Data to Support TPFDD Development
- The Creation of JOPES Records is Done as a Two Step Process:
  - JMPS Creates External Data Files Containing Cargo Increment Numbers and Movement Data
  - These Data are Used by a Separate Program that Generates the JOPES Records



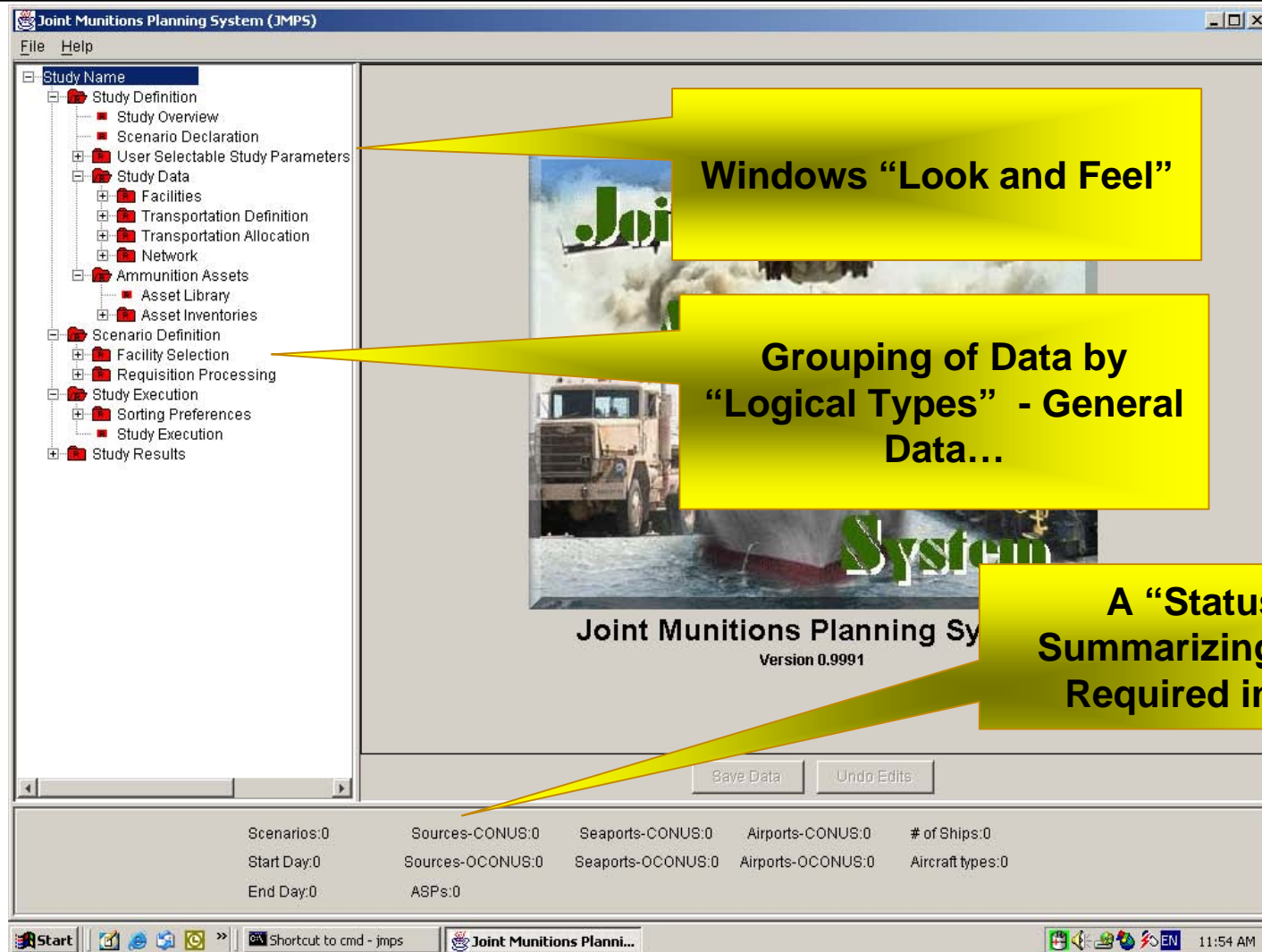
# ***JMPS Operating Environment***

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- Operates Under Windows OS on a Typical PC Desktop Computer Platform (i.e., no Specialized Equipment)
- Developed Using “Vanilla” Java (i.e., no Proprietary Software)
- Analyst’s Reports Generated Offline Using Crystal Reports

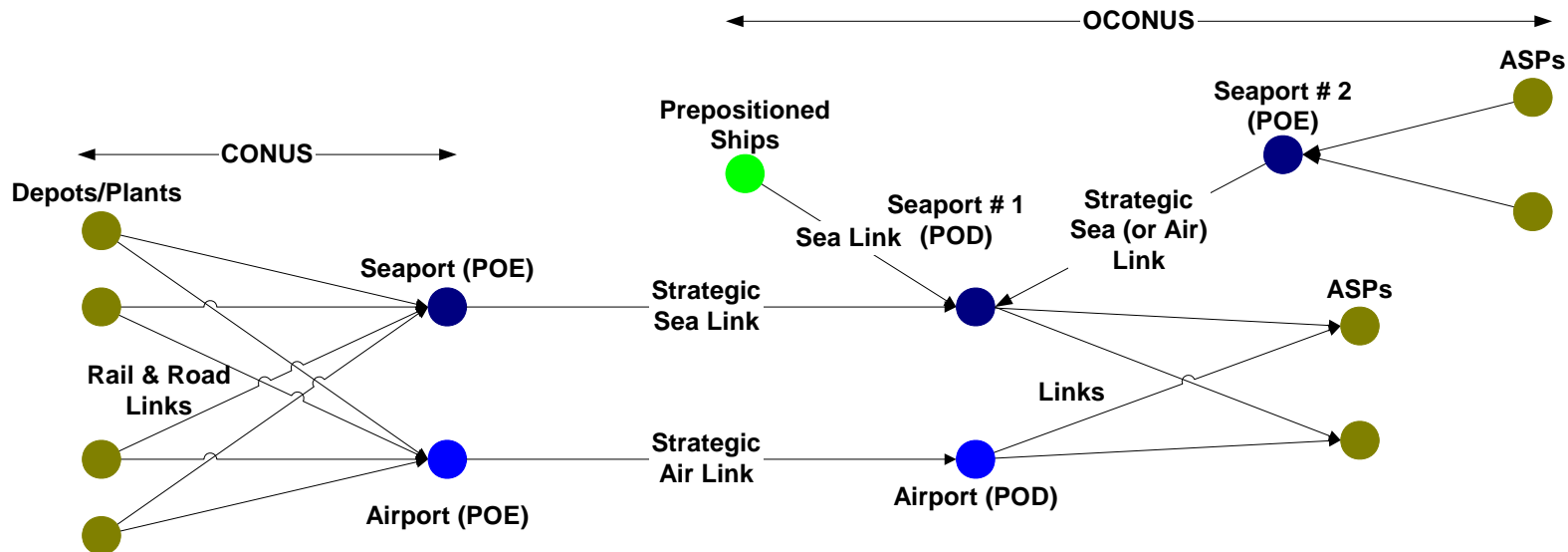


# Key Features of JMPS: Analyst-Oriented User Interface System





# Key Features of JMPS: User Defined Transport Network



## JMPS Transport Network Features

- User-Defined Nodes (Sources, Transfer Nodes, ASPs) and Links
- Drop Shipments to SPOEs and APOEs
- Ammo Production (When Required)\*
- Support for Multiple POD Destinations\*
- Use of Prepositioned Ships as “Floating Nodes”
- Sourcing from Non-Theater OCONUS Locations

\*Future capability

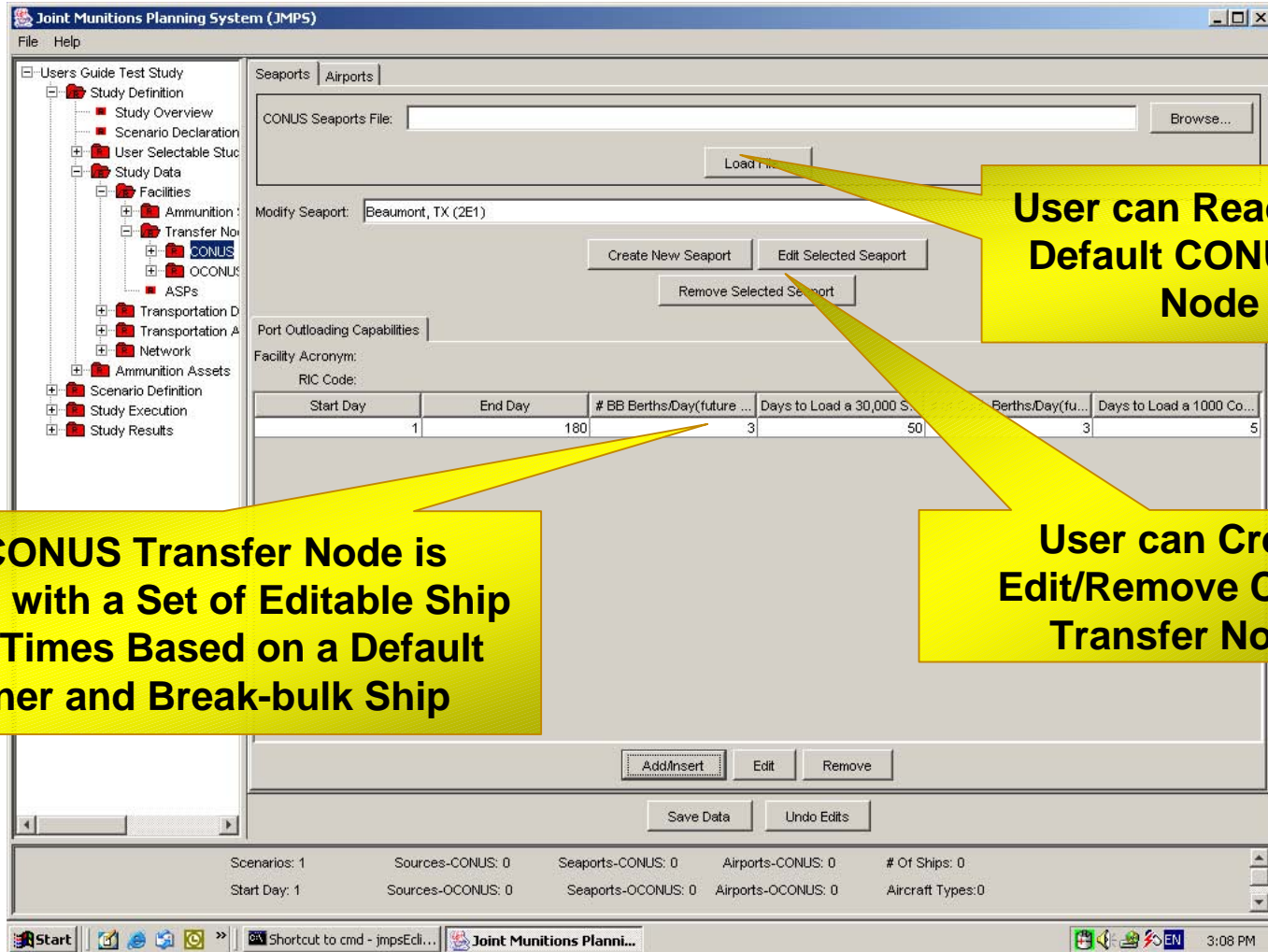


# Key Features of JMPS: User Defined Transport Network – CONUS Source Nodes

The screenshot shows the JMPS interface with the 'Facilities' section selected in the left-hand tree. The main window displays the 'Depots' tab, showing a list of facilities. A yellow callout points to the 'CONUS Source Node File' field, stating: 'User can Read in External Default CONUS Source Node Data'. Another yellow callout points to the 'Create New Depot', 'Edit Selected Depot', and 'Remove Selected Depot' buttons, stating: 'User can Create/Edit/Remove Source Nodes'. A third yellow callout points to the 'Outloading Capabilities' table, stating: 'Each CONUS Source Node is Described with a Set of Editable Outloading Data Based on the DD 1726 Data'. The table shows columns for Start Day, End Day, and various outloading capabilities (Peaceti..., Mobiliza...). The status bar at the bottom shows: Scenarios: 1, Sources-CONUS: 15, Seaports-CONUS: 2, Airports-CONUS: 1, # Of Ships: 29, Start Day: 1, Sources-OCONUS: 0, Seaports-OCONUS: 1, Airports-OCONUS: 1, Aircraft Types: 2, End Day: 180, ASP Nodes: 2.

Start Day	End Day	Peaceti...	Peaceti...	Peaceti...	Peaceti...	Peaceti...	Mobiliza...	Mobiliza...	Mobiliza...	Mobiliza...
0	0	1	6	1	5	10	3	14	26	
1	1	3	19	2	15	29	4	29	53	
2	2	3	19	2	15	29	4	29	53	
3	3	4	48	3	39	73	4	47	89	
4	4	5	72	4	58	108	5	58	108	
5	5	0	0	0	0	0	5	58	108	
6	6	0	0	0	0	0	0	0	0	
7	7	0	0	0	0	0	0	0	0	
8	8	0	0	0	0	0	0	0	0	
9	9	0	0	0	0	0	0	0	0	
10	10	0	0	0	0	0	0	0	0	
11	20	0	0	0	0	0	0	0	0	

# Key Features of JMPS: User Defined Transport Network – CONUS Transfer Nodes



# Key Features of JMPS: User Defined Transport Network – Transportation Network Linkages

The screenshot displays the JMPS (Joint Munitions Planning System) interface. A yellow callout box labeled "PODs and PODs" points to the "New Air Force and M..." menu item. Another yellow callout box labeled "OCONUS Sources and ASPs" points to the "OCONUS Port to OCONUS Port" and "OCONUS Port to ASP" tabs. A third yellow callout box labeled "CONUS Sources and SPOEs/APOEs" points to the "CONUS Source to CONUS Port Road/Rail Links" and "CONUS Port to OCONUS Port" tabs. A fourth yellow callout box labeled "PODs and ASPs" points to the "Link Start" list. A fifth yellow callout box labeled "POEs and PODs" points to the "Link End" list. The "Edit Link" dialog box is open, showing the "Please enter number of days for the Link:" field with "Road" set to 1 and "Rail" set to 5. The "Created Links:" list shows "Anniston Army Depot, AL to Beaumont, TX". The status bar at the bottom displays various statistics: Scenarios: 1, Sources-CONUS: 15, Seaports-CONUS: 2, Airports-CONUS: 1, # Of Ships: 29, Start Day: 1, Sources-OCONUS: 0, Seaports-OCONUS: 1, Airports-OCONUS: 1, Aircraft Types: 2, End Day: 180, ASP Nodes: 2.

**PODs and PODs**

**OCONUS Sources and ASPs**

**CONUS Sources and SPOEs/APOEs**

**PODs and ASPs**

**POEs and PODs**

Scenarios: 1 Sources-CONUS: 15 Seaports-CONUS: 2 Airports-CONUS: 1 # Of Ships: 29  
Start Day: 1 Sources-OCONUS: 0 Seaports-OCONUS: 1 Airports-OCONUS: 1 Aircraft Types: 2  
End Day: 180 ASP Nodes: 2

# ***Key Features of JMPS: Use of “Real-World” Transport Asset Data***

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- Shipments can be Transported on 16 Default Ship Classes or on User-Defined Ships
- The # of Ships Available are User-Defined as are Their Initial “In-Port” Disposition



Photo of MV Green Wave

## **MV Green Ridge**

- Length: 507'
- # of Holds: 1
- Hold Length: 507'
- Hold Width: 70'
- Hold Height: 27'
- Maximum # of Containers: 450
- Maximum Cargo Weight: 12,290 LT
- Maximum Speed: 17 knots



# ***Key Features of JMPS: Use of “Real-World” Transport Asset Data***

---

- Shipments can be Transported on 11 Default Aircraft Classes (4 Military and 7 Commercial) or on User-Defined Aircraft
- The # of Aircraft Available per Day are User-Defined



## **C-17 Globemaster III**

- Cargo Compartment: 1,056” L X 148” H X 216” W
- Pallet Positions: 18
- Maximum Cargo Capacity: 170,000 lbs.

# ***Key Features of JMPS: Use of “Real-World” Transport Asset Data***

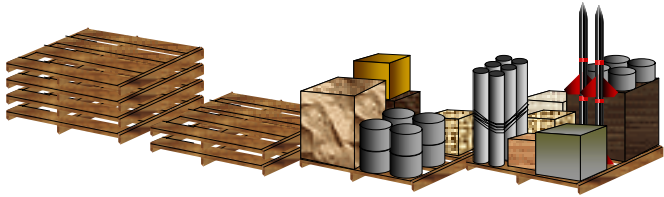
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- Default Data for Container and Break-bulk Trailers and Railcars are Provided
- A 20' Container is Taken as the Standard Container
- There is an Implicit Assumption that Sufficient Quantities Exist of Containers, Trucks, and Railcars



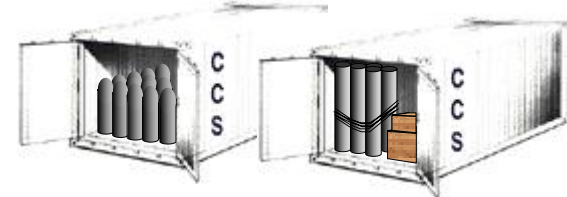
# Key Features of JMPS: Explicit Stuffing of Containers

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"Assets"

...are stuffed into...



"20' Containers"

- User can Modify Container Parameters (e.g. Container Specifications, Cargo Weight, Pallet Size and Weight, Amount of Dunnage, etc.)
- Single DODACs are Stuffed in a Container (Stuffing of Multiple DODACs was Designed, but Currently not Used)
- Support for Cropable Items has been Deferred



# Key Features of JMPS: User Controlled Processing – Defining the Transport Allocations

The screenshot shows the 'Ships' tab in the JMPS interface. It includes a 'File:' field with a 'Browse...' button and a 'Load File...' button. Below these are three input fields: 'Percentage of Ships at Port When Study Begins (0.0 - 1.0):' with a value of 0.25, 'Minimum # Days for Ships to Reach Port:' with a value of 5, and 'Maximum # Days for Ships to Reach Port:' with a value of 25. At the bottom, there is a table with two columns: 'Ship Class' and 'Number Available to Study'.

Ship Class	Number Available to Study
MV 1st Lt Harry L. Martin Class	4
SS Green Valley Class	4

The User Defines the Initial Distribution of Ships in Port and How Long it will Take Ships to Reach Port

The User Defines the # of Each Ship Class Available for the Study

By Aircraft Type, the User Defines the # of Aircraft Available per Day

The screenshot shows the 'Aircraft' tab in the JMPS interface. It includes an 'Aircraft Availability File:' field with a file path and a 'Browse...' button. Below this is a 'Load Allocation File...' button. A 'Select Aircraft Type:' dropdown menu is set to 'C-5 Galaxy'. At the bottom, there is a table with three columns: 'Start Day', 'End Day', and 'Number Available'.

Start Day	End Day	Number Available
1	30	1

The Aircraft Allocation can Vary During the Course of a Study

The screenshot shows the 'Aircraft' tab in the JMPS interface. It includes an 'Aircraft Availability File:' field with a file path and a 'Browse...' button. Below this is a 'Load Allocation File...' button. A 'Select Aircraft Type:' dropdown menu is set to 'C-17 Globemaster'. At the bottom, there is a table with three columns: 'Start Day', 'End Day', and 'Number Available'.

Start Day	End Day	Number Available
1	30	1
45	75	1



# Key Features of JMPS: User Controlled Processing

## – Defining the Ordering of the Network Nodes

CONUS | OCONUS | Pre-Positioned Ships

Scenario: Scenario 1

Select Depots To Be Included In The Scenario

Available Depots

Depots Included In Scenario

- Anniston Army Depot, AL (BAD)
- Blue Grass Army Depot, KY (B47)
- Camden (LTV)
- Hawthorne Army Depot, NV (BD2)
- Letterkenny Munitions Center, PA (BKD)
- Pine Bluff Arsenal, AR (BA9)
- Red River Munitions Center, TX (BRD)
- Sierra Army Depot, CA (B2D)
- Tooele Army Depot, UT (BTD)

Select Plants To Be Included In The Scenario

Available Plants

Plants Included In Scenario

- Crane Army Ammunition Activity, IN (BB2)
- Iowa Army Ammunition Plant, IA (B13)
- Lake City Army Ammunition Plant, MO (B38)
- Lone Star Ammunition Plant, TX (B19)
- McAlester Army Ammunition Plant, OK (BC2)
- Milan Army Ammunition Plant, TN (B51)

**For Each Scenario in a Study, the User Selects the Sources that can be Used...**

des

Browse...

Load File...

Preferred Order

- Anniston Army Depot, AL (BAD)
- Blue Grass Army Depot, KY (B47)
- Camden (LTV)
- Crane Army Ammunition Activity, IN (BB2)
- Hawthorne Army Depot, NV (BD2)
- Iowa Army Ammunition Plant, IA (B13)
- Lake City Army Ammunition Plant, MO (B38)
- Letterkenny Munitions Center, PA (BKD)
- Lone Star Ammunition Plant, TX (B19)
- McAlester Army Ammunition Plant, OK (BC2)
- Milan Army Ammunition Plant, TN (B51)
- Pine Bluff Arsenal, AR (BA9)
- Red River Munitions Center, TX (BRD)
- Sierra Army Depot, CA (B2D)
- Tooele Army Depot, UT (BTD)

Reset Preferred Order

**...and the Preferred Order in Which they will be used**



# Key Features of JMPS: Information Rich Environment

## “On Screen” Review of Solutions

ORIGINAL REQUEST																					
Reque...	Scena...	DODA...	Nome...	Air/Gr...	Ammo...	Service	Projec...	Desig...	Move...	Priorit...	Final D...	Final ...	Final D...	Quanti...	RDD	Soluti...	Numb...	Numb...	Total ...	Over/...	
F00002	Scenar...	1325F...	BOMB ...	A	watch ...	F	AF1	A	H	2	Saudi ...	ASP	SA1	917	25	C	3	watch ...	918	1	

Separate Records when Split Shipments are Required

SOLUTIONS																							
S...	Source	So...	Item Sou...	Prime...	Im...	Q...	Nu...	Weight	S...	S...	SOU...	POE ...	PO...	A...	L...	Transport Name		POD...	PO...	Arr...	Unl...	ET...	Da...
1	Crane Army ...	BB2	1325F275	PRIME	A	82	0	167157.00	20	20	Truck	Dover ...	DOV	21	22	C-17 Globemaster - Instance 1.22		King ...	KFD	23	23	25	0
2	Crane Army ...	BB2	1325F275	PRIME	A	82	0	167157.00	21	21	Truck	Dover ...	DOV	22	23	C-17 Globemaster - Instance 1.23		King ...	KFD	24	24	26	-1
3	Crane Army ...	BB2	1325F275	PRIME	A	82	0	167157.00	22	22	Truck	Dover ...	DOV	23	24	C-17 Globemaster - Instance 1.24		King ...	KFD	25	25	27	-2
4	Crane Army ...	BB2	1325F275	PRIME	A	82	0	167157.00	23	23	Truck	Dover ...	DOV	24	25	C-17 Globemaster - Instance 1.25		King ...	KFD	26	26	28	-3
5	Blue Grass A...	B47	1325F128	SUBS...	C	60	3	44825.00	1	1	Rail	Militar...	1N4	6	8	MV Green Ridge Class - Instance 2		Ad D...	PF3	29	31	33	-8
6	Blue Grass A...	B47	1325F270	SUBS...	C	60	3	122310.00	1	1	Rail	Militar...	1N4	6	8	MV Green Ridge Class - Instance 2		Ad D...	PF3	29	31	33	-8
7	Crane Army ...	BB2	1325F275	PRIME	C	372	47	13322.00	14	14	Rail	Militar...	1N4	21	23	MV Green Ridge Class - Instance 4		Ad D...	PF3	44	46	48	-23
8	McAlester Ar...	BC2	1325F128	SUBS...	C	136	17	23322.00	14	14	Rail	Militar...	1N4	21	23	MV Green Ridge Class - Instance 4		Ad D...	PF3	44	46	48	-23

**Separate Records when  
Split Shipments are  
Required**

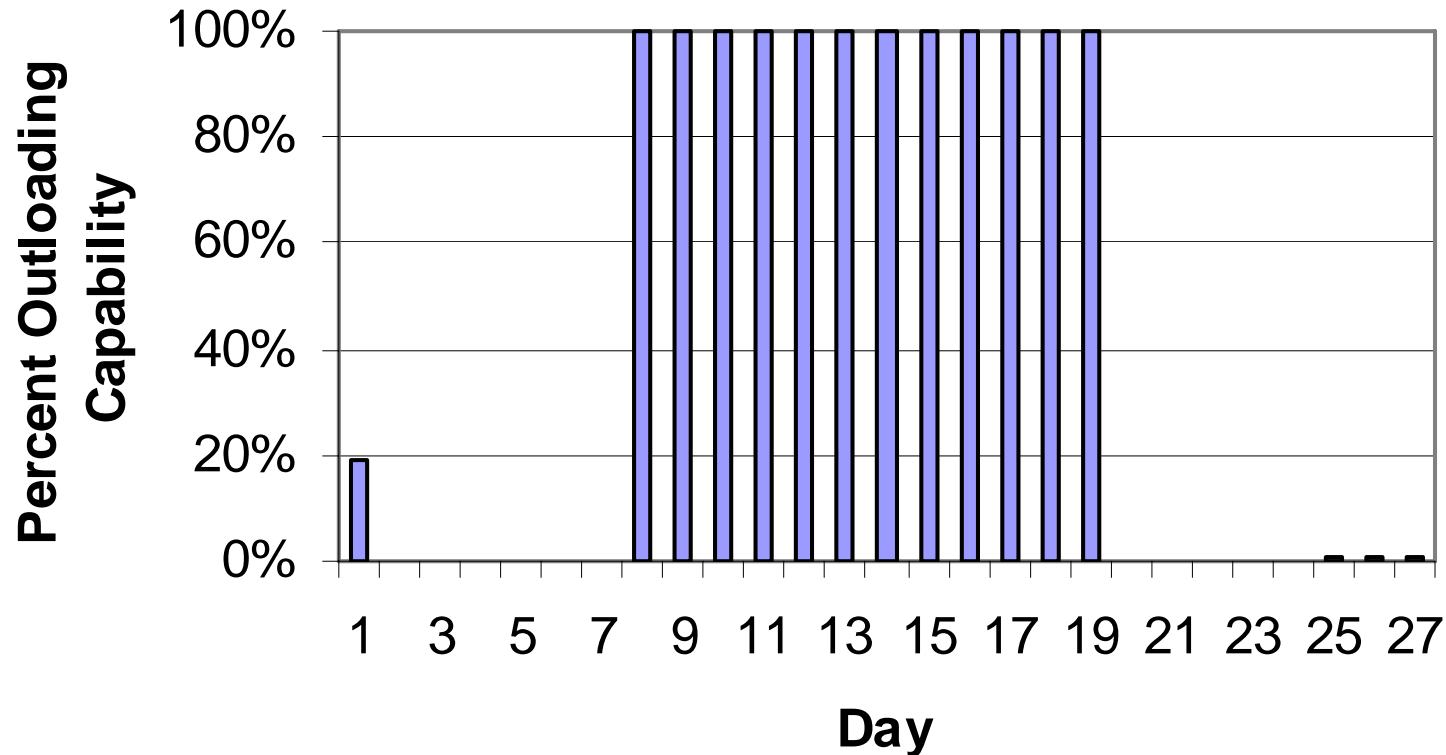
**Describes if the Item Shipped  
was a “Prime” or  
“Substitute” Item**



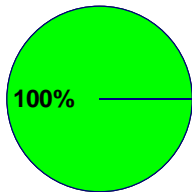
# ***JMPS Information Rich Environment Enables Insight into Depot Outloading Issues***

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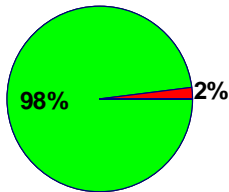
## **Crane Army Ammunition Plant**



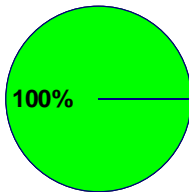
# JMPS Information Rich Environment Enables “Better” Transport Allocation Solutions



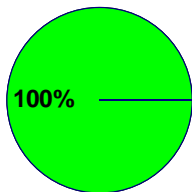
MV Green Ridge  
# 1



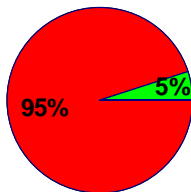
MV Green Ridge  
# 2



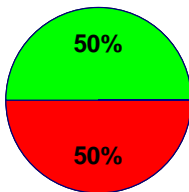
MV Green Ridge  
# 3



MV Green Ridge  
# 4



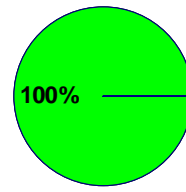
MV Capt Steven I.  
Bennett # 1



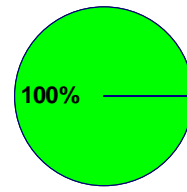
MV Capt Steven I.  
Bennett # 2

In JMPS, the Controlling Factor is the Initial Distribution of Ships Assumed in Port at the Beginning of a Study

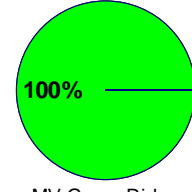
A “Smarter” Initial Distribution of Ships with Fewer Ships in Port at the Beginning Maximizes Ship Usage



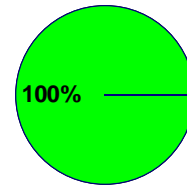
MV Green Ridge  
# 1



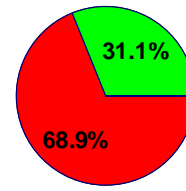
MV Green Ridge  
# 2



MV Green Ridge  
# 3



MV Green Ridge  
# 4



MV Capt Steven I.  
Bennett # 2



# ***An Example of a JMPS Sourcing Solution: Air Force and Marine Study***

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- High Level Overview:
  - 458 requests involving two ASPs
  - Air window created for days 1 to 30 (1 C-5/day for days 1 – 5 and 1 C-17/day for days 6 – 30)
  - Nine classes of ships created
  - Substitute items included
  - 151 requests unsatisfied in whole or in part



# ***JMPS Sourcing Solution: Air Force and Marine Study – High Level Overview***

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- 15,771,608.13 lbs of drop shipments
- 4,557,240.20 lbs of air shipments
  - 2 C-5 flights, 89 & 98 % full
  - 25 C-17 flights, 97-98% full
- 2,753 containers on 4 ships holding 72,228,324.75 lbs. of cargo
  - MV Capt Steven L. Bennett, 1,336 containers, 70% full
  - MV Green Ridge, 450 containers, 100% full
  - 1<sup>st</sup> SS Austral Rainbow, 840 containers, 100% full
  - 2<sup>nd</sup> SS Austral Rainbow, 127 containers, 15% full



# ***JMPS Sourcing Solution: Air Force and Marine Study – High Level Overview***

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## **Sourcing Summary**

<b>Source</b>	<b>lbs</b>	<b># containers</b>	<b>Avg % Booked</b>
Anniston	1,012,241	58	2.0
Blue Grass	948,419	39	1.6
Crane	73,200,233	2,003	86.5
Hawthorne	833,840	48	1.0
Letterkenny	284,540	22	0.8
McAlester	12,251,720	384	6.0
Pine Bluff	598,516	24	0.3
Red River	22,398	2	0.1
Sierra	261,933	16	0.2
Tooele	3,203,329	157	3.9





# Summary

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- JMPS will Provide AFSC/JMC with an Advanced Tool for the Deliberate Planning of Class V Materiel
- A JMPS Study Uses “Real World” Data and “Business Practices”
- JMPS has been Developed for the Analyst to Enable Her/Him to Quickly Set Up a Study, Run it, and Analyze it
- JMPS Tools are Being Provided to Enable the Analyst to Understand *How* and *Why* a Sourcing Solution was Achieved



# Questions???

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